Neolasioptera hibisci Felt inhabits the swollen stems of the swamp rose mallow, *Hibiscus moscheutos.*

Itonida taxodii Felt produces a conical, globular or elongate deformation of the leaf of the bald cypress, *Taxodium.*

Thecodiplosis ananassi Riley causes a fusiform twig gall on the bald cypress, *Taxodium.*

Many willows occur in aquatic or semiaquatic environment. A list of the numerous galls occurring upon the different willows is given in Economic Entomology, Journal, 4: 468–69. There are doubtless in this list, extending from pages 451 to 475, a few other species which have been reared from plants normally growing in an aquatic or semiaquatic environment.

TABANIDÆ AS INHABITANTS OF THE HYDROPHYTIC AREA.

By Raymond C. Osburn,

New York, N. Y.

All Tabanidæ undergo the larval stage in water and so belong at this time to the hydrophyte fauna, no matter how far afield the adults may roam in search of food. As the males do not attack animals they usually do not wander far and must usually be collected by sweeping the grass at the edges of the streams and swamps where the females naturally return to lay their eggs after feeding. The eggs are usually laid on the stems of grasses over the water and after hatching the young fall into the water. The writer has observed the female of *Chrysops flavidus* "dipping" over the water and occasionally touching it with the tip of the abdomen after the manner of many dragonflies, but whether eggs were being deposited in the water during this performance is not known. If so it is the only case known in this group where the eggs are deposited in the water.

The exact relations of the larvæ of Tabanidæ to special kinds of aquatic surroundings have not been carefully studied, but some notes and personal observations are at hand which indicate that some variation exists in this matter. A fairly satisfactory clue to the larval habitat is found in the occurrence of the males, which in ordinary cir-

cumstances never wander very far from the breeding places. Careful inspection may often reveal the egg-masses also. Such observations, though recorded only infrequently, show that certain species, especially of *Chrysops* (the deerflies) more often frequent the spring-fed brooks and small streams, though species of *Tabanus* (horseflies) may also breed in similar situations. Some species of *Tabanus* appear to breed mostly in small upland marshes, while others seem to be confined to the marshes about lakes. *Chrysops brunneus* and *C. flavidus* frequent the larger marshes. A few species occur in brackish waters. Thus *Tabanus costalis* is a common inhabitant of slightly saline inlets and seashore marshes, and *Chrysops flavidus* has much the same habitat, though both may frequently breed in perfectly fresh water.

A prolongation of the terminal portion of the body bearing the stigmata permits these breathing organs to be raised to the surface of the water in respiration. This tube is composed of joints which telescope into each other when the tube is withdrawn. Naturally such an adaptation is related only to a shallow water existence, since the breathing tube can be protruded to only a limited extent. As a matter of fact the larvæ are sometimes found in moist earth where there is no standing water.

In this region the following species have been taken and must be reckoned as a part of our hydrophilous fauna:

Chrysops niger Macq.....Lakehurst, N. J.
flavidus Wied.....Lakehurst and Ramsay, N. J.
callidus O. Sacken.....Ft. Lee, N. J., and Van Cortlandt Park, N. Y.
univittatus Macq.....Ft. Lee, N. J., and Lakehurst, N. J.
vittatus Wied.....Ft. Lee.
excitans Walk.....Lakehurst, N. J.
celer O. Sacken.....Van Cortlandt Park, N. Y.
carbonarius Walk.....Ft. Lee and Newark, N. J.
mœchus O. Sacken.....Ft. Lee, N. J.
obsoletus Wied.....Ft. Lee and Van Cortlandt Park, N. Y.
cuclux Whitney.....Orange Mountains.
plangens Wied.....Passaic, Newark Meadows and Staten I.

lugens var. *morosus* O. Sacken.. Lakehurst, N. J.
parvulus Daecke..... Lakehurst, N. J.
hinei. Daecke..... Lakehurst, N. J.
delicatulus O. Sacken..... Lakehurst, N. J.
sackeni Hine..... Ft. Lee and Paterson.
cursim Whitney..... Lakehurst, N. J.
brunneus Hine..... Newark Meadows.
fulvostigma Hine..... Lakehurst, N. J.
Tabanus cinctus Fabricius..... Lakehurst, N. J.
lasiophthalamus Macq..... Ft. Lee.
trispilus Wied..... Ft. Lee and Van Cortlandt Park, N. Y.
pumilis Macq..... Ft. Lee and Lakehurst, N. J.
lineola Fabr..... Paterson.
nigrovittatus Macq..... Ft. Lee and Sandy Hook.
costalis Wied..... Ft. Lee and Van Cortlandt Park, N. Y.
atratus Forst..... Ft. Lee and Van Cortlandt Park and L. I.
americanus Forst..... Ft. Lee and Palisades.
bicolor Wied..... Ft. Lee and Orange Mountains.
zonalis Kirby..... Greenwood Lake, N. J.
exul O. Sacken..... Orange Mts. and Newark.
molestus Say..... Orange Mountains.
orion O. Sacken..... Palisades.
giganteus DeGeer..... Palisades and Ft. Lee, N. J.

Any others that may be added to this list of Tabanidæ will, because of the aquatic nature of the larval stage, necessarily fall in the list of local insects inhabiting the hydrophytic area.